

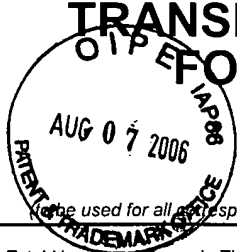
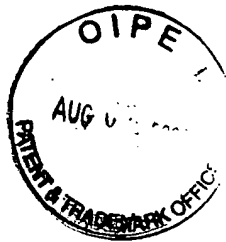
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PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

15

Application Number

09/662,006

Filing Date

September 14, 2000

First Named Inventor

Patrick K. Sullivan

Art Unit

3736

Examiner Name

Rober L. Nasser

Attorney Docket Number

65047

ENCLOSURES (Check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance Communication to TC
<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment / Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Terminal Disclaimer	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Request for Refund	Request for Certificate of Correction
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> CD, Number of CD(s) _____	PTO/SB/44
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> Landscape Table on CD	Copies of Attachments
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	Acknowledgement Post Card
<input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53		

Certificate
AUG 08 2006
of Correction

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	FULWIDER PATTON LLP		
Signature			
Printed name	Craig B. Bailey		
Date	August 2, 2006	Reg. No.	28, 786

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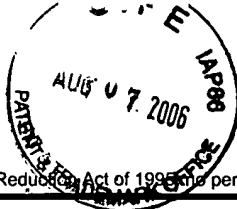
Signature			
Typed or printed name	Craig B. Bailey	Date	August 2, 2006

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PTO/SB/17 (01-06)

Approved for use through 07/31/2006. OMB 0651-0032

Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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FEE TRANSMITTAL for FY 2006		Complete if Known	
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818). <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		Application Number: 09/662,006 Filing Date: September 14, 2000 First Named Inventor: Patrick K. Sullivan Examiner Name: Robert L. Nasser Art Unit: 3736 Attorney Docket No.: 65047	TOTAL AMOUNT OF PAYMENT (\$): \$100.00

METHOD OF PAYMENT (check all that apply)
☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Deposit Account Number: 06-2425 Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below. ☐ Charge fee(s) indicated below, except for the filing fee

☒ Charge any additional fee(s) or any underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.
FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid(\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	_____
Design	200	100	100	50	130	65	_____
Plant	200	100	300	150	160	80	_____
Reissue	300	150	500	250	600	300	_____
Provisional	200	100	0	0	0	0	_____

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims Fee (\$)	Fee Paid (\$)
_____ - 20 or HP = _____	x	\$25.00	=	_____	_____

HP = highest number of total claims paid for, if greater than 20.

<u>Indep. Claims</u>		<u>Extra Claims</u>		<u>Fee (\$)</u>		<u>Fee Paid (\$)</u>
_____ - 3 or HP = _____		_____ x _____		\$100.00	=	\$0.00

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listing under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____ - 100 = _____	/ 50	_____ (round up to a whole)	x \$125.00	= \$0.00

4. OTHER FEE(S)

Non-English specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Certificate of Correction

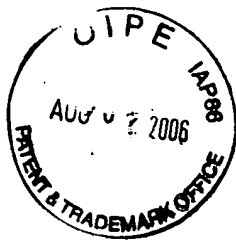
\$100.00

SUBMITTED BY			
Signature: <u>C.B. Bailey</u>	Registration No. (Attorney/Agent): 28, 786	Telephone: (310) 824-5555	
Name (Print/Type): Craig B. Bailey	Date: August 2, 2006		

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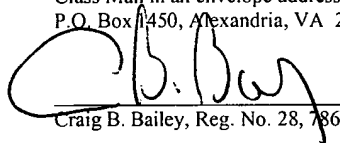
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PATENT

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Craig B. Bailey, Reg. No. 28, 786

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Inventors: Patrick K. Sullivan, et al.

Patent No.: 6,984,207 B1

Serial No.: 09/662,006

Issued: January 10, 2006

Filed: September 14, 2000

For: PASSIVE PHYSIOLOGICAL
MONITORING (P2M) SYSTEM

Examiner: Robert L. Nasser

Group Art Unit: 3736

Docket No.: HOANA-65047

August 2, 2006
Los Angeles, California

REQUEST FOR CERTIFICATE OF CORRECTION

Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

08/07/2006 MBIZUNES 00000043 6984207

01 FC:1811

100.00 OP

Serial No.: 09/662,006
Atty. Docket: HOANA-65047

AUG 09 2006

It is noted that errors appear in the above-identified patent of a clerical, typographical or minor nature or character, as more fully described below.

<u>ERROR</u>	<u>VERIFICATION</u>
Specification, Column 6, line 37, change "FIG. 14 shows schematic" to --FIG. 14 shows a schematic--	Application dated 09/14/2000 at page 13, line 20. See attachment.
Specification, Column 10, lines 58-59, change "environment using P2M" to --environment using the P2M--	Application dated 09/14/2000 at page 24, line 7. See attachment.
Specification, Column 12, line 23, change "cushions and seats and seatbacks." To --cushions on seats and seatbacks.--	Application date 09/14/2000 at page 27, line 22. See attachment.
Claim 2, Column 13, line 27, delete the word "and"	Amendment dated 01/26/2005 at page 3, line 11, Claim 89. See attachment.
Claim 5, Column 13, line 40, change "wherein each the sensors" to --wherein each of the sensors--	Amendment dated 01/26/2005 at page 4, line 3, Claim 93. See attachment.
Claim 10, Column 13, lines 62-63, change "subtracting me signals" to --subtracting the signals--	Amendment dated 01/26/2005 at page 4, line 18, Claim 97. See attachment.

All of the errors (except one) were incurred through the fault of the Patent Office. The one error resulting from the applicant's mistake occurred in good faith and correction thereof does not involve such changes in the patent as would constitute new matter or

PATENT

would require re-examination. It is requested that a certificate of correction be issued and returned to us.

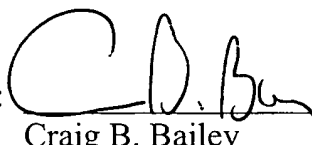
Attached hereto, in duplicate, is Form PTO-1050, with at least one copy being suitable for printing.

Attached is a check in the amount of \$100.00 to cover the necessary fees. If any additional fees are needed, please charge Deposit Account No. 06-2425.

A duplicate of this document is attached.

Respectfully submitted,

FULWIDER PATTON LLP

By: 
Craig B. Bailey
Registration No. 28,786

CBB/ykb

Enclosures

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Customer No. 24201
134443.1

Serial No.: 09/662,006
Atty. Docket: HOANA-65047

AUG 09 2005

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,984,207 B1

DATED : January 10, 2006

INVENTOR(S) : Patrick K. Sullivan; Ken C. K. Cheung; Christopher J. Sullivan; Paul Pernambuco-Wise

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6

Line 37, change "FIG. 14 shows schematic" to --FIG. 14 shows a schematic--

Column 10

Lines 58-59, change "environment using P2M"" to --environment using the P2M.--

Column 12

Line 23, change "cushions and seats and seatbacks" to --cushions on seats and seatbacks.--

Column 13

Line 27, delete the word "and"

Line 40, change "wherein each the sensors" to --wherein each of the sensors--

Lines 62-63, change "subtracting me signals" to --subtracting the signals--

MAILING ADDRESS OF SENDER

Craig B. Bailey, Esq.
Fulwider Patton LLP
6060 Center Drive, 10th Floor
Los Angeles, CA 90045

PATENT NO. 6,984,207 B1

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,984,207 B1

DATED : January 10, 2006

INVENTOR(S) : Patrick K. Sullivan; Ken C. K. Cheung; Christopher J. Sullivan; Paul Pernambuco-Wise

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MAILING ADDRESS OF SENDER

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PATENT NO. 6,984,207 B1

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APPLICATION

FOR

UNITED STATES LETTERS PATENT

FOR

PASSIVE PHYSIOLOGICAL MONITORING (P2M) SYSTEM

BY

PATRICK K. SULLIVAN
KEN C.K. CHEUNG
CHRISTOPHER J. SULLIVAN
and
PAUL PERNAMBUCO-WISE

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Figure 4 is a front view of the front panel display and user interface of the P2M system in Acquire Mode.

Figure 5 is a front view of the front panel display of the P2M system in Monitor Mode.

Figure 6 is a schematic view of a preferred embodiment of the P2M sensor.

Figure 7 shows one of the graphical user interfaces (GUI) of the P2M system.

Figure 8 shows the graphical user interface of the P2M system showing time-series and frequency-domain representations of physiological data.

Figure 9 shows measurement of Pulse-Wave Travel Time (PWTT)

Figure 10 shows a system test and evaluation results in a graph.

Figure 11 high noise and vibration testing of the P2M at Wheeler Army Air Field.

Figure 12 shows the measurement through a body armor.

Figure 13 shows testing through body armor and MOPP gear combined.

Figure 14 shows a schematic view of the Passive Physiological Monitoring (P2M) System Using a passive sensor array and microelectronics incorporated into a MEDEVAC litter.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The preferred P2M system is a monitoring device with two major subsystems, one to measure signals and the other to process

a survey comparing and ranking the usage of the three methods.

Testing of the P2M system for pulse and respiration in a high noise and vibration environment was performed at Wheeler Army Air Field, on March 5, 1999. Tests were performed during static display of a MEDEVAC helicopter. The main purpose of the test was to characterize the high noise/vibration environment using the P2M, microphones and accelerometers. Results showed that through filtering and signal analyses, the P2M was able to discern physiological signals from the high amplitude and frequency noise caused by the helicopter to output accurately pulse and respiration. No conventional methods were performed at this test due to the high-noise environment, which would render those methods useless.

Figure 11 shows the high noise and vibration testing of P2M at Wheeler Army Air Field, on March 5, 1999.

Next, in response to inquiries made by the flight medics during the March 5, 1999 testing at Wheeler, the ability of P2M system to accurately monitor pulse and respiration through layers of clothing and gear was tested. Fragmentation protective body armor, Military Oriented Protective Posture (MOPP) gear, and a combination of the two were tested using the P2M system. Results showed that the P2M performed with higher fidelity with the additional layers between the subject and the sensor, which is largely due to the increased contact area and efficient transmission of mechanical and acoustic signals through the solid layers.


of these signals contains a measure of physiologically generated signal and environmental noise. The environmental noise on each pad will be similar, whereas the physiologically generated signals may be position dependent. This information is used to separate the signal from the noise using proven techniques. Position dependent physiological signals are used to determine patient position, heart rate, respiration, blood pressure, pulse strength distribution, and potentially some measure of cardiac output.

The invention may be incorporated into a wide range of applications apart from the MEDEVAC litter. The passive sensor array may be configured without much change to operate on a hospital bed or an ordinary mattress used at home. Of particular note is the area of premature infant care. In this case, the attachment of sensor leads to the infant may often be difficult, causing irritation of sensitive skin and entanglement in leads. The sensor may be incorporated into equipment for use in both civilian and military sectors. The sensor may be incorporated into field equipment, clothes and uniforms. This includes, but is not limited to, cervical collars, body armor, biological and/or chemical hazard protection suits, extraction devices, clothes, cushions on seats and seatbacks. Exercise equipment, such as stationary bicycles, treadmills or steppers may benefit by incorporating sensors into the supports.

Physiological indicators such as heart rate may be detected through handholds as an aid to regulating the exercise regime.

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Craig B. Bailey, Reg. No. 28, 186



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 09/662,006
Applicant : Patrick Sullivan, et al.
Filed : September 14, 2000
Art Unit : 3736
Examiner : Patricia C. Mallari

Docket No.: : HOANA-65047
Customer No. : 24201

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Dear Sir:

In response to the Office Action of July 28, 2004, kindly amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 11 of this paper.

57 – 88 (Canceled).

89. (Currently amended) A method for passively monitoring the physiology of a patient in an environment, comprising:

coupling a first sensor with the patient;

coupling a second sensor with the patient at a location remote from the first sensor;

sensing physiological parameters of the patient and conditions of the environment around the patient with both the first and second sensors;

converting the sensed physiological parameters and environment conditions into signals;

correlating the signals from the first and second sensors; and

using the correlation to extract signals associated with the physiology of the patient;

calculating an energy spectrum from the signals; and

extracting signals associated with the physiology of the patient by identifying peaks in the energy spectrum corresponding to physiological parameters of the patient.

90. (Previously presented) The method of claim 89, wherein the first and second sensors comprise passive electromechanical transducers for sensing mechanical activity of the patient's body.

91. (Previously presented) The method of claim 90, wherein the sensors comprise piezoelectric sensors.

92. (Previously presented) The method of claim 89, wherein each of the first and second sensors comprise a polarized polymer film with piezoelectric properties.

93. (Previously presented) The method of claim 90, wherein each the sensors comprise a polyvinylidene fluoride (PVDF) film.

94. (Previously presented) The method of claim 92, wherein an interface is disposed between the film and the patient for facilitating transmittal of physiological parameters from the patient to the film.

95. (Currently amended) The method of claim ~~93~~ 94, wherein the interface is selected from the group consisting of gel, water, air, foam, rubber and plastic.

96. (Previously presented) The method of claim 89, wherein the sensing step comprises sensing noise and vibration in the environment around the patient.

97. (Previously presented) The method of claim 89, further comprising:
placing a third sensor in a location isolated from the patient for sensing said environmental conditions without said physiological parameters of the patient;
sensing environmental conditions with the third sensor;
converting the sensed environmental conditions into signals; and
reducing environmental interference in the signals produced by the first and second sensors by subtracting the signals produced by the third sensor from the signals produced by the first and second sensors.

98 – 106 (Cancelled).

107. (Currently amended) Apparatus suitable for passively monitoring the physiology of a patient in a vibration environment, comprising: